

# **Update on Development of Draft Habitat Restoration Conservation Measures**

**BDCP Steering Committee  
August 22, 2008 Meeting**

# Approach to Conservation Measure Development

- **Developed restoration concepts**
- **Identified opportunities based primarily on land surface elevation, hydrology, location, and absence of large constraints**
- **Conducted coarse feasibility and DRERIP analyses**
- **Coordinated with HOTT to assess performance of selected floodplain and intertidal marsh restorations**
- **In-process of selecting and describing draft conservation measures for presentation to Steering Committee**

# Restoration Concepts

- **Floodplain restoration:** identified 9 restoration opportunities
- **Intertidal marsh restoration:** identified 10 restoration opportunities
- **Channel margin habitat restoration:** identified restoration opportunities for improving habitat corridors and as a component of floodplain restoration
- **Transitional grassland/sea level rise accommodation:** component of intertidal marsh restoration opportunities

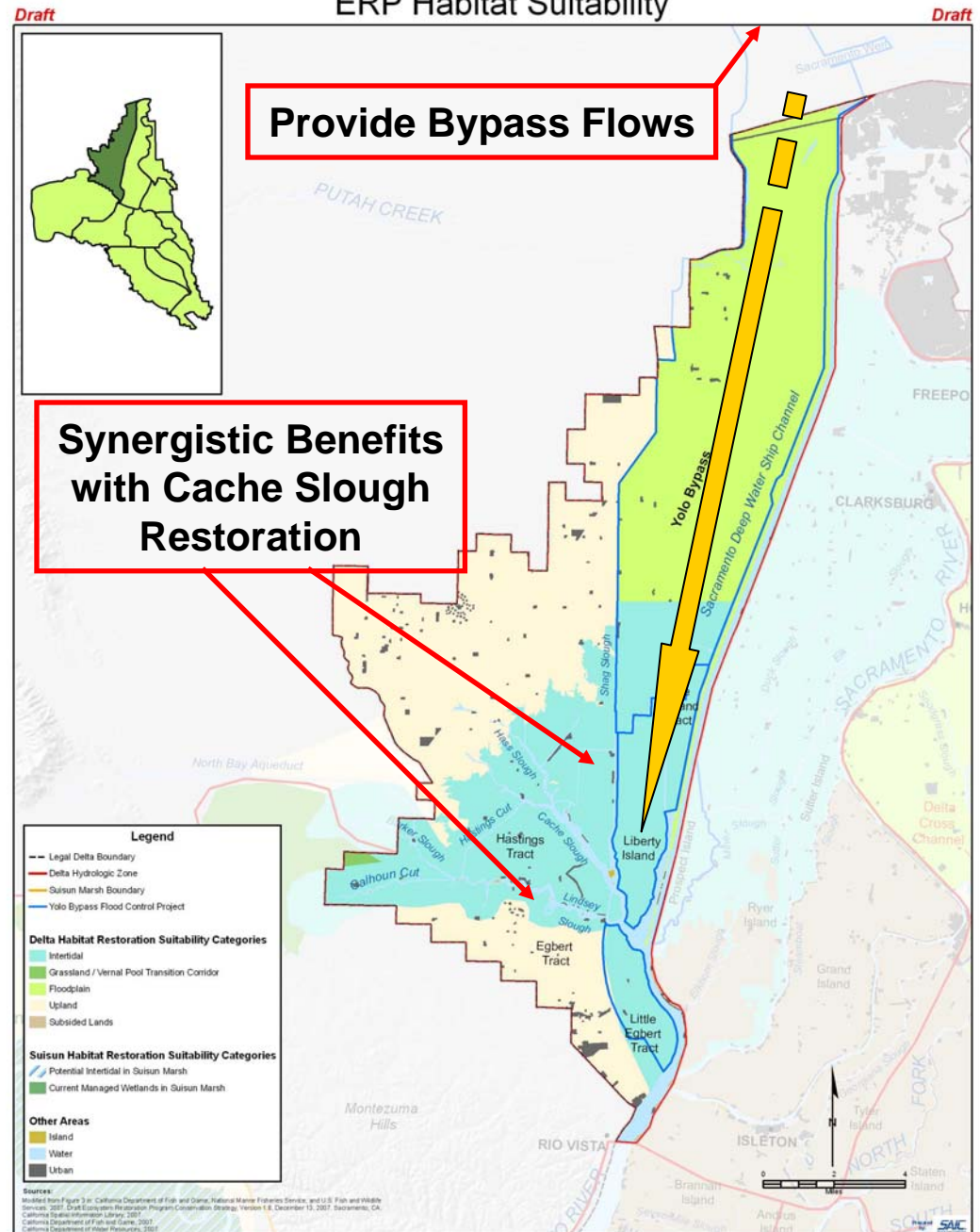
# Overview of Promising Restoration Zones

- **Yolo Bypass floodplain restoration**
- **Upper San Joaquin River floodplain restoration**
- **Cache Slough intertidal marsh restoration**
- **West Delta intertidal marsh restoration**
- **Suisun Marsh intertidal marsh restoration**

## Yolo Bypass Floodplain Restoration Actions

- Notch Freemont Weir and install an operable gate
- Design gate to provide efficient fish passage
- Construct a canal from the gate to guide flows to the Tule Canal/Toe Drain
- Provide for inundation flows for at least 45 consecutive days at higher frequencies than under current conditions
- Estimate 29,000 acres of with 4,000 cfs at new weir height

## Zone 1 - Yolo Bypass/Cache Slough ERP Habitat Suitability



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# Yolo Bypass Floodplain Restoration

## Benefits

- Food production and food export into the Delta
- Improved fish passage, reduced risk of illegal harvest
- Increased availability of splittail spawning habitat
- Increased availability of high quality salmonid and splittail rearing habitat

# Yolo Bypass Floodplain Restoration (cont.)

## Implementation Considerations

- **Methylation of mercury**
- **Reduced Sacramento River flow effects on outmigrating American and Feather River fish**
- **Relationship to existing and proposed land uses and regional conservation plans for terrestrial species**

# Yolo Bypass Floodplain Restoration (cont.)

## Implementation Considerations

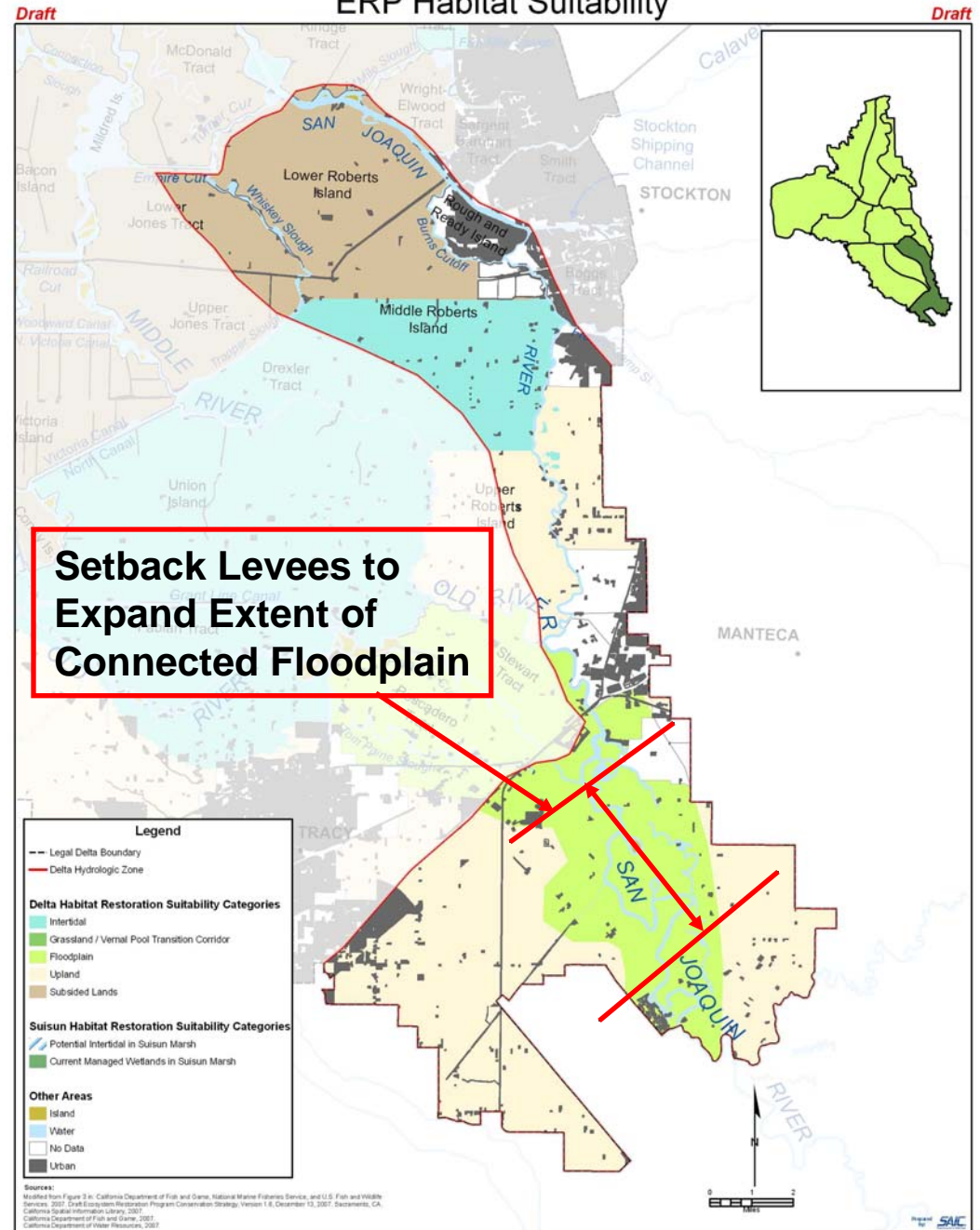
- **Coordination with existing Yolo Bypass conservation programs**
- **Integration with flood control system/coordination with U.S. Army Corps of Engineers**
- **Modification of a flood control project may require Congressional authorization (e.g., notching weir, bypass modifications)**



## Upper SJR Floodplain Restoration Actions

- Setback levees downstream of Vernalis
- Could inundate about 4,000 acres of new floodplain every 5.5 years for 30 consecutive days
- Design new levees to be “green”
- Allow for natural establishment of a mosaic of woody and herbaceous riparian, grassland, and wetland habitats

## Zone 10 - Mainstem San Joaquin River ERP Habitat Suitability



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# Upper San Joaquin River Floodplain Restoration

## Benefits

- Increased availability of splittail spawning habitat
- Increased availability of splittail and Chinook salmon rearing habitat
- Increased food production and export to the Delta
- Increased habitat for riparian-associated covered species

# Upper SJR Floodplain Restoration (cont.)

## Implementation Considerations

- **Methylation of mercury**
- **Toxics mobilized from newly inundated agricultural lands (short term)**
- **Possibility for DO problem if late flood produce algal blooms**

# Upper SJR Floodplain Restoration (cont.)

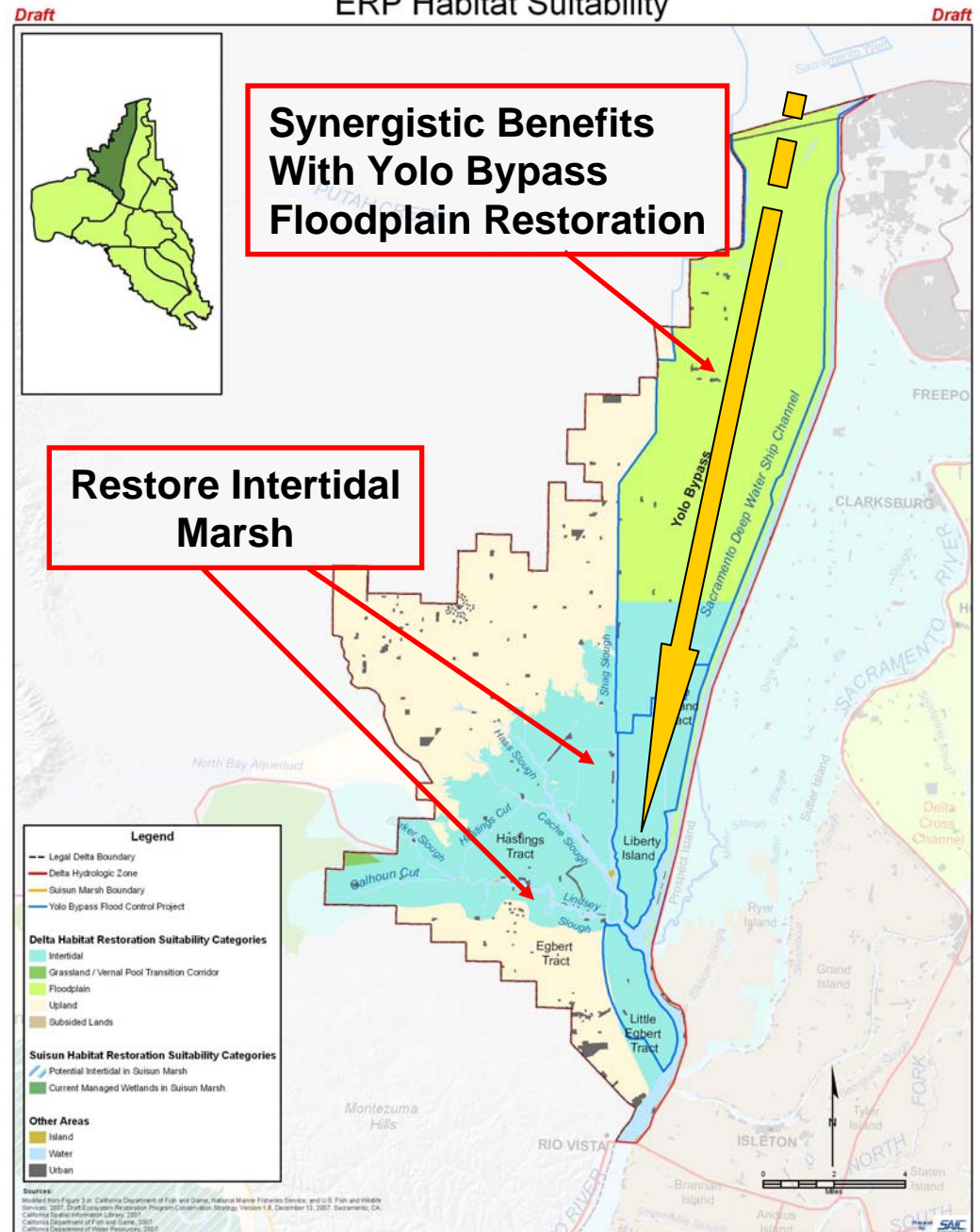
## Implementation Considerations

- Relationship to existing and proposed land uses
- Potential restoration areas are largely in private ownership
- Integration with flood control system/coordination with U.S. Army Corps of Engineers
- Modification of a flood control project may require Congressional authorization

## Zone 1 - Yolo Bypass/Cache Slough ERP Habitat Suitability

### Cache Slough Restoration Actions

- Restore mosaic of intertidal, subtidal, riparian habitat (up to 25,000 acres)
- Breach/setback levees to provide for tidal exchange
- Create dendritic channel patterns
- Restore stream functions to improve spawning conditions for delta smelt



# Cache Slough Intertidal Marsh Restoration

## Benefits

- Increased primary and secondary production in the marsh complex
- Increased export of organic carbon and food to the Delta (via tidal exchange and flushing flows from Yolo Bypass)
- Increased spawning habitat area for delta smelt and splittail
- Improved rearing habitat for larval and juvenile delta smelt, splittail, green and white sturgeon, and salmonids
- Localized reduction in water temperatures
- Increased habitat for other intertidal marsh-associated species

# Cache Slough Intertidal Marsh Restoration (cont.)

## Implementation Considerations

- Effects of increased Yolo Bypass flows on existing delta smelt habitat areas
- Compatibility with flood control functions of the Yolo Bypass
- Potential for egeria infestation and increased abundance of non-native fish predators
- Potential for short-term nutrient driven blooms with flooding of agricultural lands

# Cache Slough Intertidal Marsh Restoration (cont.)

## Implementation Considerations

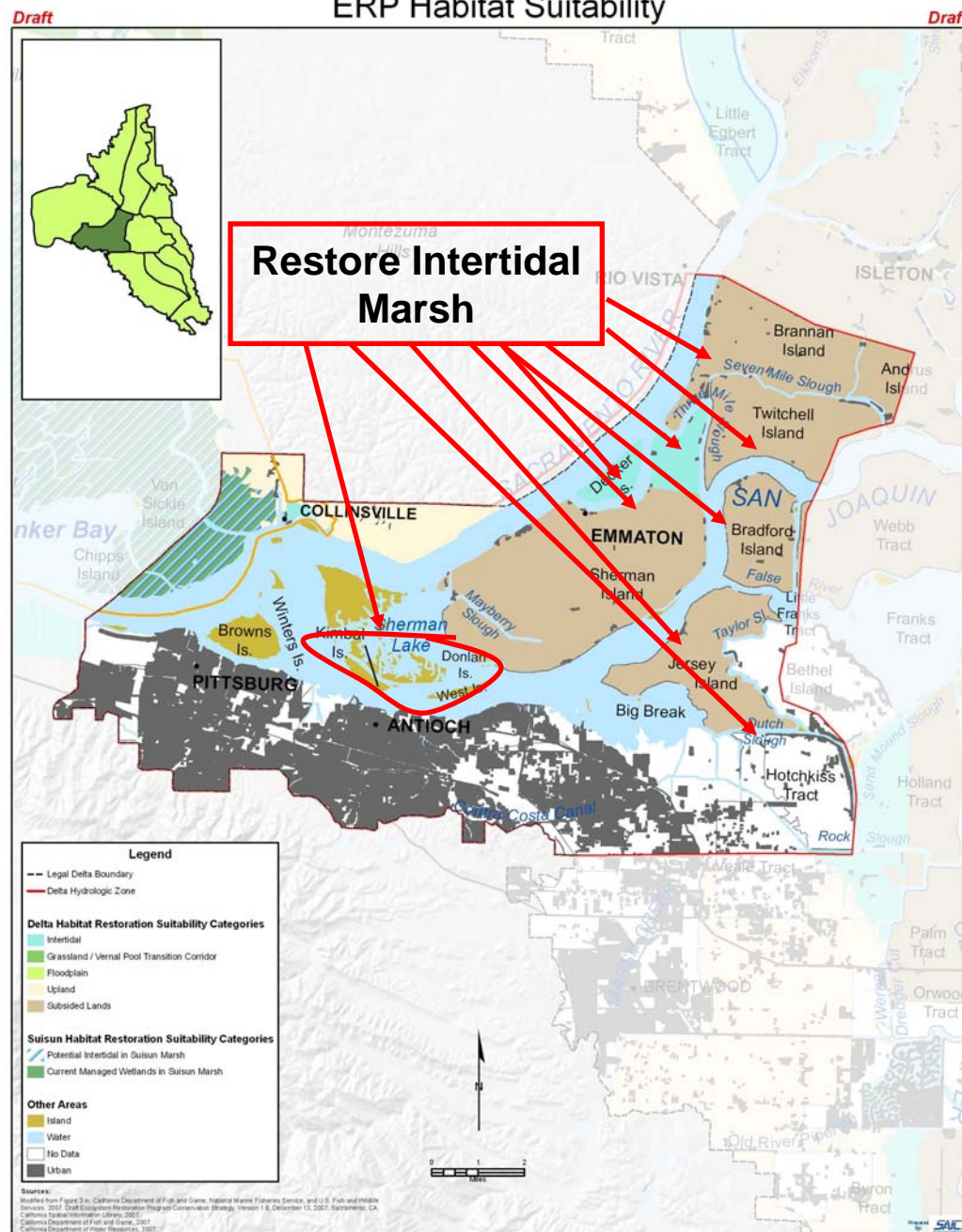
- **Coordination with existing Cache Slough/lower Yolo Bypass conservation programs**
- **Address Barker Slough intake**
- **Subsidence reversal (e.g., Little Egbert Tract) for future restoration of intertidal marsh**
- **Restoration areas are largely in private ownership**



## West Delta Intertidal Marsh Restoration Actions

- Restore intertidal marsh on an estimated 4,000-8,000 acres with suitable elevations
- Early subsidence reversal using fill material
- Long-term subsidence reversal on deeply subsided lands
- Breach/remove/modify levees to provide for tidal exchange and establishment of intertidal marsh

## Zone 7 - West Delta Tidal Gradient ERP Habitat Suitability



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# West Delta Intertidal Marsh Habitat Restoration

## Benefits

- Splittail and salmonid rearing habitat
- Expanded area of intertidal marsh within future low salinity zone with sea level rise
- Increased export of organic carbon and food to the West Delta and Suisun Bay

# West Delta Intertidal Marsh Habitat Restoration

## Benefits

- Restored habitats for other intertidal marsh-associated species
- Potential reduction/consolidation of in-Delta diversions
- Improved habitat corridor between Suisun Marsh and upstream habitats

# **West Delta Intertidal Marsh Habitat Restoration (cont.)**

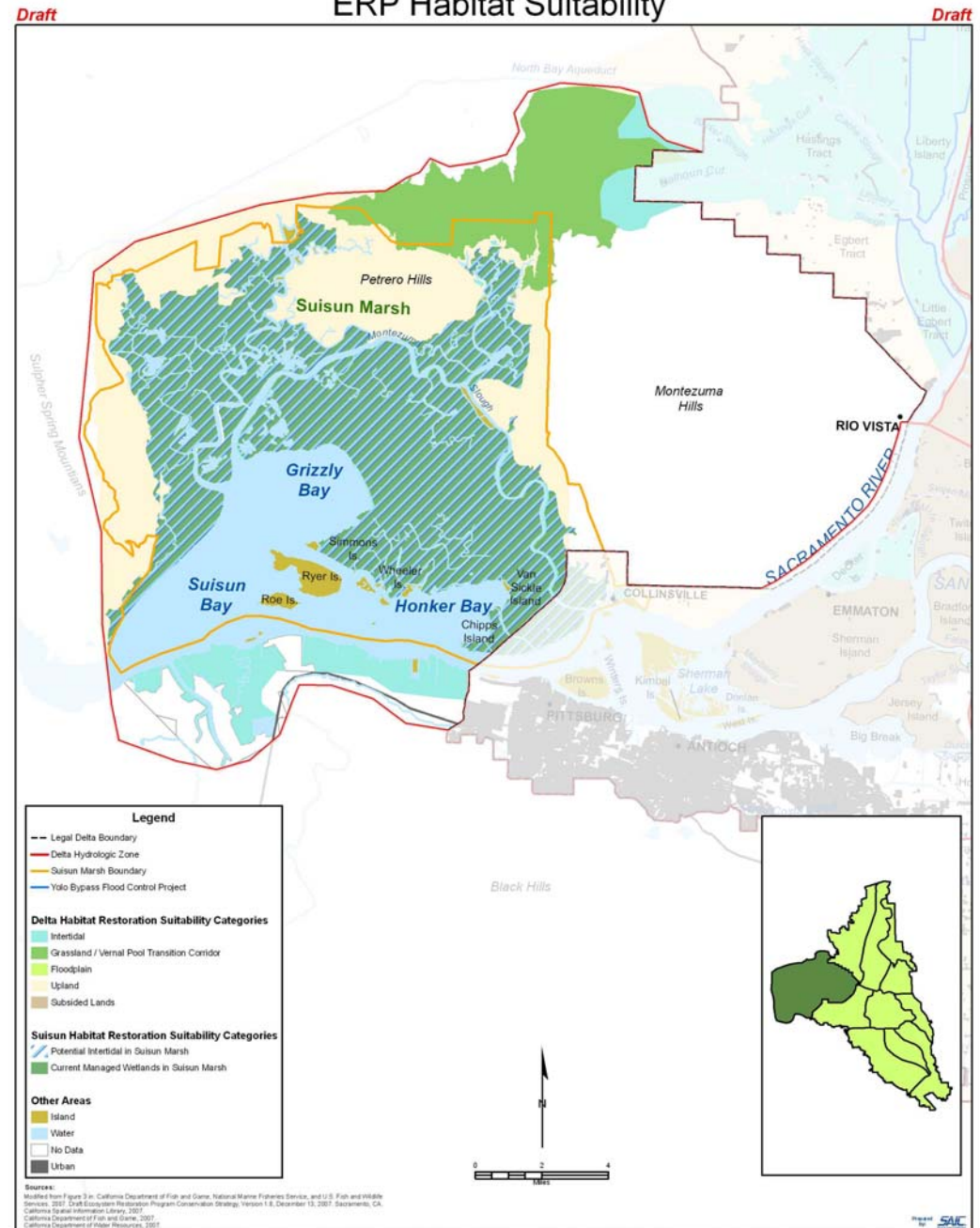
## **Implementation Considerations**

- **Availability and sources of fill material**
- **Potential for egeria infestation and increased abundance of non-native fish predators**
- **Land base to accommodate long-term sea level rise**

## Suisun Marsh Intertidal Marsh Restoration Actions

- 7,000-9,000 acres of restoration currently planned
- Breach dikes to introduce tidal exchange
- Reconnect remnant sloughs to reintroduce tidal connectivity to slough watersheds
- Early reversal of shallowly subsided lands

### Zone 11 - Suisun Brackish Tidal ERP Habitat Suitability



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# **Suisun Marsh Intertidal Marsh Habitat Restoration**

## **Benefits**

- **Local reductions in water temperatures**
- **Increased rearing habitat for splittail, juvenile salmonids, and delta and longfin smelt**
- **Increased export of organic carbon and food to Suisun Bay**

# **Suisun Marsh Intertidal Marsh Habitat Restoration (cont.)**

## **Benefits**

- **Reduction in low DO events associated with removing release of black water from seasonal wetlands**
- **Reduction in entrainment risk with reduction of managed wetland diversions**
- **Restored habitats for other intertidal marsh-associated species**

# **Suisun Marsh Intertidal Marsh Habitat Restoration (cont.)**

## **Implementation Considerations**

- **Likelihood for removal of increased food production by clams**
- **Effects of breaching/removing dikes on position of the low salinity zone**
- **Many opportunities are on private lands**
- **Coordination with existing conservation programs**



## Next Steps

- **August 27—** HRPTT finalizes proposed habitat restoration conservation measures and important science questions
- **September 10—** Proposed habitat restoration conservation measure package distributed to the Steering Committee
- **September 19—** Steering Committee discusses proposed habitat restoration conservation measures

**Questions?**

**Discussion**